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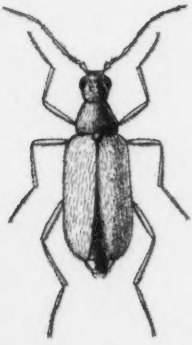

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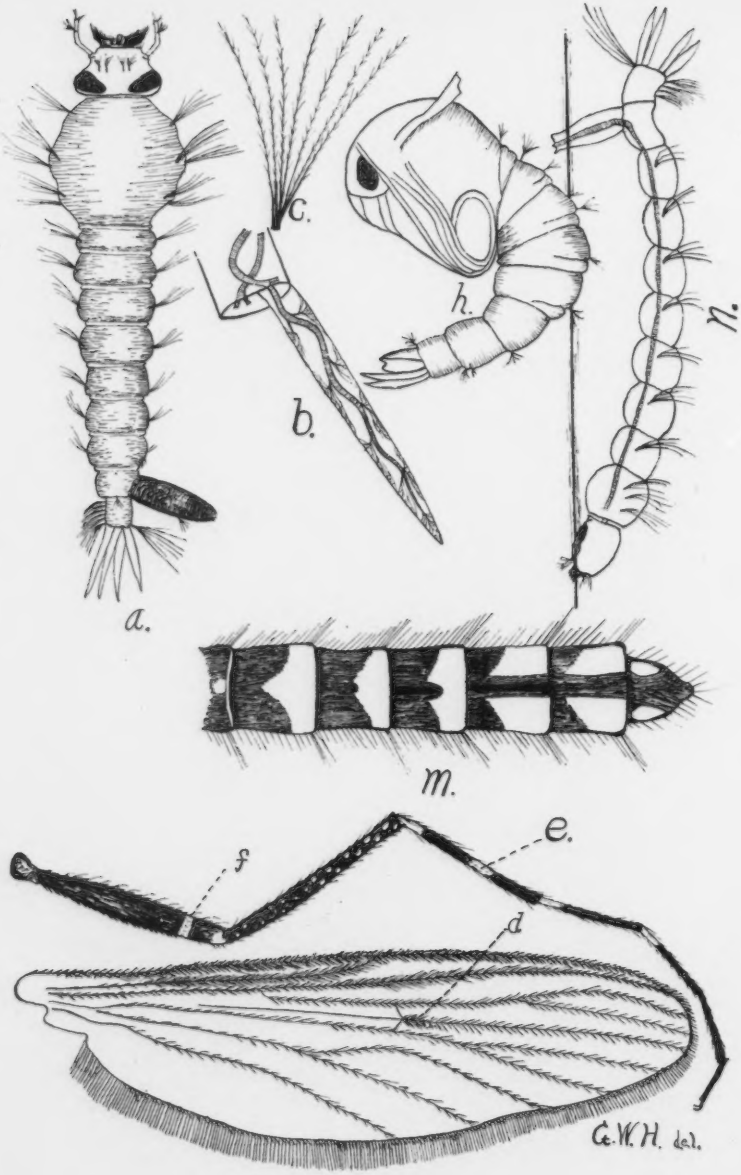


CRABHAMIA JAMAICENSIS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XV. MARCH, 1904. No. 3.

CONTENTS:

Herrick—Notes on the Life History of Crabhamia Jamaicensis..... 81
Rehn—A new Melanoplus from New Jersey 85
Viereck—A Handsome Species of Tachysphex from Arizona (Hymen.) 87
Kearfott—Micro-Lepidoptera Suggestions, Part I..... 89
Grundel—Notes on the Life History of Chrysophanus Gorgon..... 97
Crawford—Two new Halictus from N. Jersey 97
Brimley and Sherman—North Carolina Records of Odonata in 1903..... 100
Editorial 103
Entomological Literature..... 104
Doings of Societies..... 107
Obituary: B. F. Koons..... 112

Notes on the Life History of Crabhamia Jamaicensis.

BY GLENN W. HERRICK.

(See Plate VIII.)

In a monograph of the Culicidæ, Vol. i, page 345, Mr. F. V. Theobald describes the female of a new species of *Culex*, which he names *C. jamaicensis*. In Vol. iii, page 244, of the same monograph, he describes the male of the same species but under the new generic name of *Grabhamia*. He says that "this beautiful species has so far only occurred in Jamaica." Furthermore, he expresses the opinion that it is rather uncommon in that island. During the summers of 1902 and 1903, I found this mosquito abundant in the vicinity of Agricultural College, Miss. The habits of the larvæ proved of considerable interest and seemed worth recording.

I first noted the larvæ in an open sewage drain on the College campus in 1901. They attracted my attention by their large size as compared with the larvæ of *C. fatigans* which were so numerous in the same drain. At this time several adults were taken from the weeds and grasses overhanging the ditch. They were submitted to Mr. D. W. Coquillet who immediately recognized them as *Culex jamaicensis*, now *G. jamaicensis*. In the

summer of 1903, I noted scores of large larvæ in a roadside pool near Starkville, Miss. At first sight they appeared to be the larvæ of *Anopheles*, for, apparently, they were in horizontal positions. Never having seen *Anopheles* larvæ so abundant, it seemed worth while to stop and examine them in some detail. Much to my astonishment these larvæ were found to be members of the genus *Culex*, or at least, of some genus closely related to *Culex*. Moreover, the great majority of them were lying apparently horizontal just below the surface film of water. Of these, many adults, both males and females, were reared and they proved to be *G. jamaicensis*. From this time forth many larvæ of this species were found in other rain water pools and abundant opportunity was afforded to observe them. With the one exception of those found in the sewage ditch, I have always found these larvæ in transient rain water pools.

The larvæ are interesting from the position they assume in the water. When the larva rises to the surface it assumes, at first, about the same position as the larva of *Culex*. But after a moment, if left undisturbed, the body, with a slight jerk, floats quickly to an approximately horizontal position with the head on a level with the surface of the water, in which position the mouth brushes are able to skim the surface, as it were. The larva can change quickly and easily from the horizontal to the suspended position. The body instead of lying so nearly horizontal as does that of *Anopheles*, hangs suspended,—like a piece of slack rope,—between the head and respiratory tube, and considerably below the surface of the water. The respiratory tube projects out of the water, at least a third of its length, and points forward when the larva assumes the horizontal position. The thorax is inclined sharply upward so as to bring the head to a horizontal position. Figure I, *n*, is purely diagramatic but serves to show the position of the larva. At the distance of a few feet, when looking directly down upon the larvæ, they seem to lie in the same position as those of *Anopheles*. The larvæ are splendid swimmers and are constantly swimming along the surface but nearly always in a backward direction.

The anal filaments are much longer and slenderer than those

of *C. fatigans*, reminding one strongly of the anal filaments of *Psorophora ciliata*. Dr. Howard remarks that the anal filaments "may possibly function as gills while the larvæ are very young." In the anal filaments of a young larva of *G. jamaicensis*, the tracheæ are very large and as well developed as in other parts of the body. The two main body tracheæ extend on beyond the respiratory tube throughout the length of the last abdominal segment. Each of these bifurcates and sends a branch to each of two anal filaments. The filaments seem to be set in pairs corresponding to the bifurcated tracheæ. The last abdominal segment with its two main tracheæ and with one anal filament is shown at *b*, Figure I.

The respiratory tube of the larva is much longer than that of *C. fatigans* or *C. pungens*.

The pupa also is much larger than the pupa of *C. pungens*. By observing a large number of pupæ, I found that in midsummer, the pupal stage lasts almost exactly forty-eight hours.

Mr. Theobald states that the eggs, as noted by Dr. Grabham, are laid singly. Although careful search for the eggs was repeatedly made they could not be found. The larvæ would invariably appear in a pool within twelve hours after the formation of the pool by a rain storm. The conviction was graddually forced upon me that the eggs were deposited in or upon the mud to await the coming of the rain. Such a habit of egg deposition for this species is a matter of circumstantial evidence only, for absolute proofs of it are wanting. Since making the observations on this species, Dr. J. B. Smith has published the results of his experiments with *Culex sollicitans*. In these experiments, Dr. Smith proved, conclusively, that *C. sollicitans* deposits its "eggs singly, in dry mud or moist soil, and that for months they lie thus, ready to hatch when covered by water of a proper temperature." Since the publication of the third volume of Theobald's "Monograph," we find that he has removed *C. sollicitans* to the genus *Grabhamia*, thus showing the close relation of the two species under discussion. Therefore it will not be surprising if the habit of egg deposition of *G. jamaicensis* is similar to that of *C. sollicitans*.

The adult female is a striking mosquito, with heavily scaled

wings. The scales of the wings are black and white and give to the wings a distinctively grayish appearance. The base of the third longitudinal vein, where it meets the cross-veins, has a small but distinct black patch of scales (Fig. I, *d*).

The legs are banded and speckled with yellowish white scales, giving the mosquito a distinctive appearance. The femora of all the legs have a pale band near the apex of each (Fig. I, *f*), and the knees are white. The tibiæ are strikingly speckled with patches of white scales on a background of black scales. The metatarsi have a pale ring at the base of each and a pale band in the middle (Fig. I, *e*). The first two tarsi of the front legs are banded at the bases with white (Fig. I). The others are black. All the tarsi of the hind legs are banded with white.

The abdomen (Fig. I, *m*), also has very characteristic markings. A few yellow scales and long hairs are found on the first segment. Each of the next three segments has a triangular patch of creamy scales on the apical border, those of the third and fourth segments being broken in the middle. The patches on the fifth and sixth segments are divided in the middle thus forming distinct lateral spots.

As Mr. Theobald says, "it is a very distinct species, easily recognized by the black speck on the wing, the curious banding and mottling of the legs and the adornment of the abdomen."

EXPLANATION OF PLATE VIII.

a. larva.
b. last abdomlnal segment with one anal filament showing the tracheæ.
c. tuft of hairs from thorax of larva.
d. black patch of scales on wing.
e. median band on metatarsus of fore leg
f. band on femur.
h. pupa.
m. abdomen of imago showing markings.
n. diagram showing position of larva.

ANTHIDIUM JUGATORIUM Say.—A study of the description of this bee shows that it is a *Dianthidium*, very close to *D. perpictum* (Ckll.). It will therefore stand as *Dianthidium jugatorium*.—T. D. A. COCKERELL.

A New Melanoplus from New Jersey.

By James A. G. Rehn.

Several times during the past few years while collecting in the pine barren region of New Jersey, the author has taken specimens of a large form of the genus *Melanoplus* which differed considerably from any species known to him. Through the kindness of Prof. A. P. Morse, specimens of this have been compared with the series of the genus in the Scudder collection and nothing of similar character found.

From the localities in which the new species has been taken it would appear that dry scrubby pine land is preferred. It is, apparently, a rather abundant species, as in a few minutes work at the type locality a series of about a dozen was taken.

I take pleasure in dedicating this striking species to my friend Mr. Witmer Stone of the Academy of Natural Sciences. Mr. Stone has made a study of the fauna and flora of the pine barren region, and assisted in collecting all the specimens of this species taken.

Melanoplus stonei n. sp.

Types: ♂ and ♀. Between Harris and White Horse, Burlington Co., New Jersey. August 13, 1902. Collected by Witmer Stone and J. A. G. Rehn. (Acad. Nat. Sci. Phila.)

A member of the *packardii* group and related to *M. packardii* and *fœdus*, but distinguished by the smaller size, more compressed and excavated vertex and fastigium, the narrower frontal costa (which also has a distinct stricture below the junction with the fastigium), the smaller furcula, the greater interval between the mesosternal lobes in both sexes, and in the rich and striking coloration.

♂ Size medium; form rather slender. Head with the occiput gently rounded; vertex rather strongly constricted, and with the blunt depressed fastigium very distinctly sulcate; frontal costa sub-equal, slightly and very gradually expanding inferiorly, distinctly compressed at its junction with the fastigium, moderately sulcate at and below the ocellus; eyes reniform, slightly longer than the infra-ocular portion of the genæ; antennæ equal to the head and pronotum in length. Pronotum slightly slightly expanded on the metazona; anterior margin truncate; posterior margin obtuse-angulate with the angle broadly rounded; prozona slightly

longer than the metazona, the latter strongly punctate on the lateral lobes; median carina obsolete on the prozona, distinct but low on the metazona; lateral lobes with the lower margin very obtusely angulate; transverse sulci very distinct; dorsal aspect passing into the lateral lobes without carinæ, but with a distinct shoulder. Tegmina rather narrow, subequal, slightly surpassing the apex of the abdomen, apex rounded. Prosternal spine erect, conical, the apex slightly antrorse. Interval between the mesosternal lobes sub-quadrate, expanding; interval between the metasternal lobes longitudinal, about four times as long as broad. Supra-anal plate with distinct median and lateral sulci; furcula extremely short and strongly divergent; cerci short, with a distinct median constriction, apical portion with the lateral face excavated and deflected internally, apical margin sub-rotundate with a slight inferior shoulder; subgenital plate moderately compressed, the lateral margins very slightly arcuate, the apex posterior to the margin of the plate and developed as a distinct tubercle. Anterior and median femora tumid, the anterior distinctly curved; posterior femora rather slender, but with the genicular regions rather broad.

♀ Size rather large; form rather heavy and robust. Head with the occiput distinctly elevated above the pronotum, rounded; vertex and fastigium rather broad, very shallowly sulcate; frontal costa rather broad, subequal in width, reaching to the clypeus, slightly sulcate at and below the ocellus; eyes sub-reniform, the anterior margin almost straight, but little shorter than the infra-ocular portion of the genæ; antennæ about equal to the head and pronotum in length. Pronotum much as in the male, but the whole structure is more inflated, and the metazona is very slightly shorter than the prozona. Tegmina reaching to, but not exceeding, the valves of the ovipositor. Prosternal spine erect, short, blunt, slightly compressed transversely. Interval between the mesosternal lobes quadrate, slightly longitudinal; interval between the metasternal lobes longitudinal, expanded anteriorly and laterally confined by the curved metasternal lobes. Anterior and median femora not inflated as in the male, rather slender, slightly arcuate; posterior femora a little more robust than the same parts in the male.

General color above bistre, below gamboge yellow. Head mottled bistre and wood brown, the distinct, rather narrow, post-ocular streak shining black; occiput with a dark median area margined laterally by obscure bars of a lighter tint; antennæ dull gamboge yellow. Pronotum above with a broad median longitudinal bar of vandyke brown, somewhat mixed with blackish laterally; lateral margins of the disk of the pronotum with a rather distinct bar of wood brown, which becomes obsolete posteriorly; lateral lobes with the post-ocular streak broad and shining black, occupying slightly more than the superior half of the lobe, the inferior margin of the streak supplied with two ovate white blotches, which are strongly contrasted against the shining black bar; remainder of the lateral lobes broccoli brown, slightly mixed inferiorly with wood

brown. Tegmina bistre, with a few sub-obsolete spots of ecru drab. Pleuræ blackish brown except the metathoracic episternum, which bears a prominent diagonal bar of yellowish-white. Abdomen above tessellate with blackish-brown on a dull ochraceous ground. Anterior and median limbs drab, more or less irregularly infuscate with a darker brown; posterior femora drab above and on the lateral face, the lower and internal aspect gamboge yellow, external face with diagonal blackish bars, which cross the superior face and are distinct and regular on the internal surface,* genicular arch blackish, with a patch of ecru drab below; posterior tibiæ pale claret brown, the spines black except at the immediate base.

MEASUREMENTS.

	♂	♀
Length of body	22.5 mm.	29. mm.
Length of pronotum	5.5 "	9. "
Length of tegmina	17. "	20. "
Length of anterior femora . . .	4.8 "	4.1 "
Length of posterior femora . .	12.2 "	14.2 "
Length of posterior tibiæ . . .	10. "	12 2 "

Specimens have been examined from only the type locality and Atsion, Burlington Co., New Jersey. But one specimen was taken at the latter locality, that on September 2, 1902.

But little variation is exhibited by the series examined, the differences which do exist being wholly in the intensity of the coloration and the separate or confluent character of the bars on the outer face of the posterior femora (*vide supra*).

A Handsome Species of Tachysphex from Arizona. (Hymenoptera.)

BY HENRY L. VIERECK.

Tachysphex propinquus n. sp.

This beautiful wasp is related to *T. ashmeadii* Fox, from which it is easily separated by the very acute pygidial area, the more elaborate silvery ornamentation, color, etc.

* In some specimens these bars are confluent and inseparable on the external face, but in all the specimens examined the superior and internal faces are distinctly barred. The female type belongs to the form with the form with the external bars confluent.

♀.—Length about 10 mm. *Head*:—Clypeus shining, with small and large punctures separated by irregular spaces, the anterior margin prominent, slightly subemarginate in the middle; front with small confluent, imperfect punctures, giving a rugose appearance to the integument, vertex with some small imperfect punctures, largely tessellate; space between the eyes across the summit of the vertex equal to about three-fourths mm.; first joint of flagellum a little more than two-thirds the length of the second; impressed space back of the posterior ocelli heart shaped or nearly, shining and with a central longitudinal depression.

Thorax:—Sculpture much like that of the front, with a shallow impression medially extending from the interior margin to somewhat beyond the middle; scutellum convex, slightly impressed medially, more distinctly and sparsely punctured than the dorsulum, shining; post scutellum dull; metathorax finely, uniformly coriaceous; posterior face with fine transverse striæ and a longitudinal, nearly almond-shaped impression with point down; mesopleura more finely sculptured than disc of metathorax; anterior tarsi with about fifteen bristles to the comb; middle tarsi with eight spines or more on the first joint between base and apex; posterior tarsi with only one or two spines on the first joint between base and apex (by first joint is meant the metatarsus); length of radial nervure between the stigma and first transverse cubitus about equal to the distance between the first and second transverse cubiti on the radius, length of radius between the second and third transverse cubiti about two-thirds the length of the preceding segment.

Abdomen:—Five mm. long; dullish, very finely sculptured; pygidial area shining, slightly convex, a few punctures on the sides, bounded laterally by a sharp raised margin.

Predominating color dark ferruginous; the head is black except clypeus, basal half of mandibles, scape and first three joints of flagellum, which are rather smoky ferruginous, the pedicellum and joints of the flagellum beyond the third are blackish, face with a more brilliant and dense silvery appressed pubescence than rest of head, dorsulum largely black, the reddish color almost obscured, clothed with silver pubescence like the head, but not so dense except on the sides; a spot on scutellum, a spot on metanotum and a small patch on mesopleura blackish, appressed pubescence on these parts not so heavy as on the face, more abundant on the sides than on the dorsum; a broad satiny border of appressed pubescence on segments one to four, notched on each side basally; wings hyaline, nervures dark brown or black; legs sericeous of the same hue as the abdomen, pulvilli and large spur of four posterior tibiæ black.

Type, property of Academy of Natural Sciences, Philadelphia.

Type locality, Florence, Arizona. One specimen taken 23 July, 1903, by Mr. C. R. Biederman.

Micro-Lepidoptera—Suggestions.

By W. D. Kearfott.

Part I.—Pinning and Setting.

Micro-Lepidoptera in North America are in for a boom, if one dozen letters from new correspondents within the past thirty days, asking for directions of all sorts regarding setting, collecting and breeding can be placed in evidence; and as it would be impossible to do justice to each separately, the Editors of our popular News have offered their pages.

These suggestions make no attempt to illustrate all the ways that each thing can be done, but only an effort to describe in a simple manner that can readily be followed by any boy or girl, at little expense, the methods and apparatus that I have used for the past five years, during which time I have collected, bred or received and mounted over twenty thousand specimens.

One of the most important things to get over is the fear most of us have that because an insect is very small we will certainly spoil it. This will surely be the result if we do not bear in mind that a small body contains but little moisture and will dry out and become stiff in a few hours on a summer day, unless a tight metal (zinc is best) collecting box is used, in which the cork can be moistened once in a while; and also that a setting board with a half-inch slot is not suited for spreading an insect that expands but little more.

Also remember that practice makes perfect, and do not be discouraged if the first or second or third attempt results in fairly good studies of venation but more or less poor cabinet specimens; persevere, and in the fourth or fifth or tenth attempt we will want to call in all the family to see how skillful we are becoming.

Pins.—I use only two sizes, the larger, English, made by Kirby, and known as No. 1 Steel, needle-pointed, black japanned. These are very thin and remarkably stiff, made of spring steel; the head and point can almost be bent together and when released will spring back perfectly straight. The head of this pin is pressed out of the same wire of which the

pin is made, just like a common household white pin, and never comes off.

The smaller ones are German made, and known as Minutien Nadeln; they are very fine, also steel, black-japanned and needle-pointed, length about half an inch; their use involves a double mount, which will be referred to later.

Avoid as a pestilence any pin, white, black or gold, that is part or all brass. Verdigris will surely result sooner or later. Also avoid steel pins with heads made of a different metal squeezed on. These heads will come off at most inopportune times, and the resultant spring of the pin will send the wings and abdomen in every direction.

Don't permit the dealer to sell what he has in stock, but insist on the right sort and he will be forced to get a supply of them.

PINNING.—Half the work of good setting is the way the pin is put through the thorax. It should rake well forward and the point should enter as nearly as possible the exact center of the thorax, and if the proper angle is observed it will come out on the under side through the posterior edge of the last thoracic segment, and thus be clear of and prevent damage to the legs; as shown in Fig, 1.

Fig 1

Never lift a specimen with your fingers, at any stage of its progress from the net to your cabinet. Always have at hand a small pair of fine-pointed forceps; the kind jewelers use are

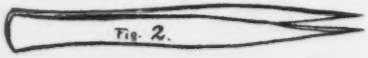


Fig. 2.

the best, about 4 inches long, cost about 15 cents; and whenever a specimen has to be moved (before the pin is in it) use these fine forceps, catching hold by a leg, never by the wing.

It requires a little practice and patience to pin properly. I usually lift the insect carefully by one leg and lay it in the crevice formed by holding the forefinger of my left hand against the thumb, always with the head of the insect pointing toward me. Then, with the same forceps in right hand, pick up a Minutien Nadeln, being sure to have the point in the right

direction, and push through thorax until you can feel the point, then holding top of pin by forceps, push the insect to desired height, by sticking pin in a piece of soft pith, that of common elder, *Sambucus canadensis* L., being the most satisfactory. The same procedure if Kirby No. 1 pin is used, except the forceps for handling pin are unnecessary. Fig. 3.

Fig. 3.

In connection with this operation, two small points will be useful to observe. 1st: if the ends of the forefinger and thumb are very dry, the insect is liable to slip about and dodge the pin. To overcome this, dampen end of finger, rubbing it against thumb until you can feel the least bit of a sticky feeling. The second point: when pinning the insect, steady both hands by letting the tips of the two little fingers press against each other.

SETTING NEEDLES. — Nothing better than common fine cambric needles, a package costing only a few cents, stuck eye end into extra long match sticks. This is easily done by holding needle in left hand, vertically, with point on piece of hard wood,—desk-top, for instance,—in the right hand hold the match stick and firmly and gently force it down, so that the eye of the needle goes up into the stick for three-quarters of its length. The match wood being so much softer than the

Fig. 4.

top of desk, the point goes into the latter only a very little and comes out easily. A few needles will be broken, but with care the majority will be all right. Afterwards with a sharp knife whittle off needle end of stick to a neat taper. Fig. 4.

SETTING BOARDS.—Use exactly the same kind as you do for macros, but make the slot just a trifle larger than the bodies of the insects. The widths of slots of my boards range from one-sixteenth to five-sixteenths of an inch; the two sizes most commonly used have one-eighth and one-quarter inch slots.

As the pins I use will not go through thick cork without dangerous forcing, I glue a strip of elder pith on the under

side of the slot; if pith cannot readily be procured, very thin sheet cork (1-32 inch) can be used. This must be of the very best quality AAA, free from knots and holes. My boards are thirteen inches long and are made from one-quarter inch thick well seasoned white pine, of the quality known as pattern lumber. A dozen boards of this length can be made by any boy in half a day. He should first go to a carpenter shop and have this list of sticks cut out by the carpenter and smoothly planed all over.

8	strips,	¼	in. thick,	½	in. wide,	13	in. long (tops).
4	"	¼	"	1⅛	"	13	" (bottoms).
8	"	¼	"	¾	"	13	" (tops).
4	"	¼	"	1¾	"	13	" (bottoms).
8	"	¼	"	1	"	13	" (tops).
4	"	¼	"	2⅜	"	13	" (bottoms).

In addition get about six feet in length of the same boards, ¼ inch thick, ⅞ inch wide, but sawed *cross-grain*. The above is sufficient for twelve boards of three different sizes. Enough for a beginning.

To put these together, clear the desk or table of all other objects, separate the different size sticks into piles, have the cork cut into half inch wide strips—or if you can get pith have it ready, one side cut flat, take a razor or extra sharp knife to cut this, and have your glue pot in working order.

Start first and glue the cork to the bottom side of the top strips by laying two of equal width together and carefully separating them exactly equally their whole length one-sixteenth, one-eighth, or whatever width the slot is to be. Then hold the strip of cork in one hand, and with the brush touch both edges of one side lightly with thin glue (this must be done quickly); then lay glued side down on strips, carefully pressing, but avoid getting any glue into slot or on the center of cork that goes under slot.

Very carefully push this pair of tops to far side of table, out of the way, placing a book on them to insure drying firmly and evenly. Continue this operation until all twelve pairs of tops have cork glued under them, and then prepare the bottom boards by attaching the end and side pieces or uprights. These

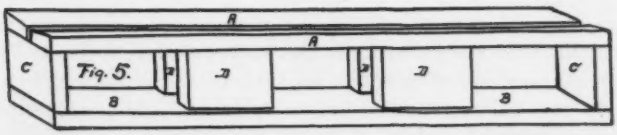
latter are made from the cross-grain strips, and can easily be split with a pen-knife into proper lengths, which for the end pieces must be the same as the width of the bottom boards. I use two uprights on each side of my thirteen-inch boards, about an inch wide, to give stiffness and prevent springing of the completed board.

Now with the glue brush put a liberal quantity of glue on one end only of each end and side piece, placing them in their respective positions on the bottom board. As soon as this is done, repeat the dose of glue on the top ends of these pieces, and carefully lift the first corked pair of top boards, which will be rigid enough by this time to handle gently, on top of the uprights; then move to a permanent drying place, with books or weights on top. Finish up the other eleven in the same way, and leave two days to thoroughly dry.

The boards are complete now, but perfectly flat on top, which is objectionable, and must be remedied by running a small plane a few times over the surfaces, taking the deepest cuts on the inside. The wood is so soft and easily worked that this is much simpler than it seems. I use a little steel and iron plane one and a half inches wide that cost about 40 cents.

Be very careful to see that the inside edges, which are now the upper edges of the slot, are perfectly even and level to each other. If slightly irregular, the final finish with very fine grade sandpaper will make them even.

Fig. 5 shows an outline of a finished board and position of the several parts, except the cork, which is hidden by the top boards.



A, top boards. B, bottom boards. C, end uprights. D, side uprights.

There are several ways of expanding specimens practiced by our well-known collectors, and attention and practice with

any system will insure good results. The advantage I find in the following is simplicity and rapidity; I can usually average from forty to fifty specimens per hour.

Have a goodly number of strips of paper ready; these should vary in width from one-sixteenth to three-eighths or half an inch, and an inch longer than the boards. The best paper is heavy book linen; a visit to any bookbinder or printer will find a mine of suitable strips around his trimming machine, and if he is not too busy he will put a thick layer of these scraps in the machine and shear them off in different widths. All of which will save the trouble of cutting them out with scissors and insure their edges being parallel to each other. A supply of setting pins is also required, and the best I know of are the cheap black glass-headed steel mourning pins, "Made in Germany." Thirty or thirty-five cents will buy a dozen small boxes or about five hundred.

SETTING. — With setting board in front, several setting needles handy, setting pins alongside, relaxing box on left side, and fine-pointed forceps within reach, we are ready to begin.

First select two of the narrowest strips of paper, pinning one end of each firmly into upper end of board, close to but not overlapping the slot; then with forceps take a specimen from box, quickly pin it in the slot at the top of board, with pin nearly vertical, just a little inclined forward; with needle raise the wings until they rest flat on each side, then bring the two paper strips down over the wings; in this position hold left thumb or forefinger on the strips, an inch or two below the moth, and with the setting needle in right hand, first draw one pair and then the other pair of wings into a position so that the hind margin of forewings makes a straight line; after getting each pair of wings in position, stick a pin through the strip just below and close to the moth. Continue repeating this until your board is full, and then pin on each side a wider strip of paper, to cover entirely the projecting ends of the wings. Sometimes this last process cannot wait until entire board is finished, as some specimens are more inclined to curl than others, and if the wings show the slightest tendency to

rise up, then use short outside strips for each half dozen, more or less, as may be necessary.

Fig. 6 shows upper end of board, with the inside narrow strips in position and pinned down over six moths, and a short outside strip covering the first three moths. The large black dots are the pins.

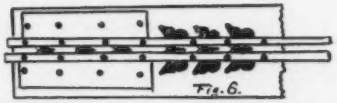


Fig. 6.

Moths die usually in one of the following three positions, and the manipulation is different for each, but all are easily handled if treated tenderly.

First, with wings down against their sides, hiding feet. It requires a little care to pin specimens in this position, but if the moth is soft or properly relaxed, it is the easiest to spread. Supposing that the pin has been inserted so that it angles forward (Fig. 1), it must be put in the board so that it is nearly vertical to the surface of the board (Fig. 7); this makes moth with head slightly higher than abdomen; run the setting needle under one pair of wings and, with a quick jerk, raise it, and the wings will be found to be in almost the correct position on the board.

Fig. 7.

Second, with wings elevated on both sides, entirely hiding the upper surfaces (Fig. 8). To set one in this position, pin as before and, holding the inner strip between second and third fingers of left hand just high enough to clear wings, with the setting needles gently press on the bases of the wings, and as they go down toward the board bring the paper strip down, and very quickly they are in position.

Fig. 8.

Third, with wings drawn close to body, sometimes almost rolled around it. This is the hardest position, but should be treated the same as the first; in fact, it is well in both of these positions to attempt to draw out the wings before the pin is all the way down, being careful to use the setting needle on the

under side, as a lifter, as much as possible, avoiding using the needle on the upper surfaces except to lightly bring into the final position.

DOUBLE MOUNTS.—Fig. 9 shows a double mount complete. To prepare the little strips, take a sheet of ⅛-inch AAA cork, and with parlor paste stick a sheet of good quality white paper on one side only, and place between two books or in a letter-press for a few hours to dry smoothly and evenly. Then, with a very sharp knife, cut the sheet into strips about an eighth of an inch wide; then cut these strips into short lengths, three-eighths to three-quarters of an inch long. Stick a No. 6 pin through one end of each, with the white paper side up. Have plenty of these mounts on hand, and as you remove your specimens from the setting boards, those that are pinned with Minutien Nadeln can be immediately pinned on the double mount, and as soon as locality label is placed on the big pin, as shown on figure, are ready for the cabinet.

Fig. 9.

The locality labels are nearly of as much importance as the insect, and a collection with every specimen bearing label showing place and date of capture is worth about ten times as much cash value as the same collection with the labels absent.

My labels are printed with locality on top line, my name on second line, and a blank space left below the name for the date. I strongly urge all collectors to have their names on the label. It adds much to the interest in the specimens, and, as is often the case, if the species is new, whoever describes it can give credit to its actual discoverer. In dating labels don't use figures for indicating the month. Either write it in full if short-name month, or abbreviate if too long to write in full, or use the Roman letters, *i. e.*, vi, 26 equals June 26th or, if your preference is to put the day first, 26, vi. It will always be understood.

(To be continued.)

MOTHER POTATO BUG—"Run, children! get under this toadstool! We are going to have a shower of paris green!"

Notes on the Life History of Chrysophanus Gorgon.

By J. G. Grundel, Alma, Santa Clara Co., Cal.

The female *Chrysophanus gorgon* deposits eggs in the forks of a long-stemmed species of *Eriogonum*, a plant which only grows on the very dry hillsides.

Only one egg is laid in a given fork, but others repeat the act until as many as five or six are found in one place.

The eggs are deposited in June, and the young larvæ emerge in or about the latter part of August, and make their way to the lower part of the plant and hide among the old leaves feeding but very little and only on the upper or green side of the leaf, which the larva resembles in color, being of a dark green.

The larvæ feed only during the night and early morning up to about 9 o'clock, A. M., growing but very slowly, being only one-eighth of an inch long by the latter part of October.

After several moultings the appearance of the larvæ changes to a furry light green, nearly white and exactly resembling the under side of the leaves upon which only it feeds and on which it also fastens its cocoons, becoming full fed about May 1st, a year from the time the eggs were laid, and when full grown one-half inch long, with body thick at middle and tapering to both ends; head very small and hardly to be seen, even when feeding, and appears to be lifeless when removed from the plant and remains so for several hours.

Two New Halictus from New Jersey.

By J. C. Crawford, Jr.

Halictus vierecki n. sp. ♀.—Head and thorax brassy-green, closely covered with appressed golden-yellowish pubescence, the metathorax contrasting because bare on disk, at times more greenish; pubescence below antennæ lighter colored; facial quadrangle slightly longer than wide; face closely and rather coarsely punctate, the basal half of clypeus more coarsely so, the apical half smooth, shiny, rufous; labrum and mandibles rufous; flagellum beneath dull ferruginous; mesothorax closely, finely punctate; legs dark, honey-colored, femora medially brown; inner hind spur with about four long teeth; tegulæ testaceous, pubescent, wings yellowish, splendidly iridescent, nervures and stigma testaceous; base of metathorax enclosed, finely tessellated and finely, irregularly rugose to apex; truncation and sides covered with pubes-

cence, sides closely, coarsely punctate; abdomen dark honey-color, where covered with pubescence appearing lighter; broad apical margins of segments pale testaceous; abdomen closely and very minutely punctate, covered, except disks of segments 1 and 2, with appressed yellowish pubescence; very rarely the medial segments stained with blackish; venter slightly darker than above. Length about 4 mm.

♂ unknown.

Type locality: Clementon, N. J.

Fifty specimens from New Jersey, as follows (H. L. Viereck, coll.): Clementon: on trailing blackberry, June 6, 30 ♀; June 2, 2 ♀; on *Rubus villosus*, June 2; also (without flower label) Apr. 17; May 9, 30. Riverton: Apr. 17, 2 ♀; Apr. 23; May 9; on *Solidago*, Aug. 11; on *Monarda punctata*, Aug. 11, 3 ♀. North Woodbury: June 13; on *Helianthemum canadense*, June 13. Shark River: July 7. Farmingdale: July 14. Westville: April 19; July 21. Also, one specimen received from Mr. E. S. G. Titus: East Marsh, D. C., Aug. 18, '03, W. V. Warner.

Dedicated to Mr. H. L. Viereck, from whom I received the excellent New Jersey series.

Differs from the descriptions of any *Halictus* with reddish abdomen and the clypeus anteriorly testaceous in the dense covering of yellowish pubescence, as well as in the following details:

From *creberrimus* in the clypeus greatly produced, antennæ darker beneath; rugæ reaching the apex of metathorax; abdomen without æneous reflection.

From *inconspicuus* in the metathorax not granulose, abdomen not smooth and shiny; size larger.

From *testaceus* in the metathorax closely punctate; abdomen punctate.

From *impurus* in the mesonotum not smooth and polished medially; legs not polished; smaller.

From *nymphalis* in smaller size, finer punctuation of mesonotum, color of abdomen; lighter legs.

Mesillensis is said to differ from *nymphalis* only in the bluer color and punctate first abdominal segment; so the differences given for *nymphalis* can be applied to *mesillensis* also.

Of the species given above, only *nymphalis* is known to me. In *creberrimus* and *inconspicuus* the color of the anterior margin of the clypeus is not given, as they are included above.

Halictus marinus n. sp. ♀.—Green, inclining to olive, with a very slight brassy reflection, clothed with abundant white pubescence, long and conspicuously plumose on the sides of face, pleura, scutellum, postscutellum, metathorax, base of first abdominal segment and lateral margins of other segments; head closely and moderately coarsely punctate, facial quadrangle distinctly longer than wide; clypeus with large sparse punctures, apex smooth, purplish-black; antennæ black, the flagellum dull ferruginous beneath; mesothorax finely roughened, finely and closely punctate, scutellum with two smooth spots on disc; mesopleura rather coarsely punctate, metapleura finely roughened; medial and parapsidal grooves apparent but not very distinct; base of metathorax finely, strongly longitudinally rugose to apex, not enclosed, truncation finely roughened, rounded at top; legs dark brown, femora with æneous reflection, pubescence white; inner hind spur with four long teeth, the last rather short; wings hyaline, splendidly iridescent, nervures and stigma very light honey color; tegulæ dark, pubescent, very large and pointed behind as in *tegularis*, punctate all over; abdomen finely transversely lineolate, finely, sparsely punctate, the first segment with finer, very sparse subobsolete punctures; apical margins of segments 1–2 rather narrowly testaceous, of 3–4 broadly testaceo-hyaline; all abdomen, except disks of segments 1 and 2, rather thinly covered with whitish plumose, sub-appressed pubescence, more abundant toward apex; venter dark, apical margins of segments lighter. Length 6–7 mm.

♂ unknown.

Four specimens from Ocean City, N. J., June 19, '01 (Viereck, coll.)

"Swept from grass *Scirpus*, *Ammophila*, etc., growing along the strand just within the beach, and constituting the first zone of plant life from the ocean—maybe they they were flying up from their nests in the sand." (Viereck in litt.)

Received from Mr. H. L. Viereck, who remarked: "Allied to *pilosus* Sm., but distinct by whitish pubescence and larger, less crowded punctures on dorsulum." It is also distinguished by the tegulæ, which place it in the *tegularis* group, but the large size easily separates it from those species. *Nymphæarum* also has the tegulæ punctate, but they are rounded behind; the metathorax is very coarsely rugose, and the abdomen black, easily separating it from *marinus*.

North Carolina Records of Odonata in 1903.

By C. S. Brimley and F. Sherman, Jr.

During 1903 we have collected nineteen species of Odonata not previously recorded from North Carolina, besides which we have received records of two others from other parties. Additional localities for species already recorded * have also been secured.

The collecting was done by the two authors and by Mr. S. W. Foster, who was Mr. Sherman's assistant during the summer. Thanks are due to Mr. R. P. Currie, U. S. National Museum, and Dr. P. P. Calvert, Academy of Natural Sciences, Philadelphia, for the identification of specimens.

In the following list an * before the name of a species denotes that the species has not been previously recorded from North Carolina; a B, S, or F after a record means that the species was taken by Brimley, Sherman, or Foster, as the case may be.

Gomphus exilis Selys; Lumberton, April 7, nine specimens (S & B).

Gomphus parvulus Selys; Lumberton, April 7, three specimens (S & B).

Gomphæschna furcillata Say; Raleigh, March 24, one female (S); April 3, two males (B); April 9, four males (B); July 8, one male (S); the last specimen was caught in a house.

***Basiæschna janata** Say; Southern Pines, March 28, one male (S); Lumberton, April 7, two males (B).

Nasiæschna pentacantha Rambur; Washington, N. C., July 16, one male (S).

Epiæschna heros Fabr.; Cape Hatteras, April 6, one female, H. H. Brimley.

Anax junius Drury; Beaufort, N. C., June 15, 18 (S).

Æschna (sp.); Raleigh, N. C., one specimen with broken appendages, October 16 (F). A number of good-sized Æschnas were seen on the wing during October and November (B), apparently not *A. junius* or *E. heros*.

Cordulegaster maculatus Selys; Raleigh, April 13, male and female (B).

Didymops transversa Say; Raleigh, March 31, one male (B); Lumberton, April 7, common (S & B).

Tetragoneuria cynosura Say; Lumberton, April 7 (S & B).

Tetragoneuria semiaquea Burm.; Lumberton, April 7 (S & B).

Tetragoneuria complanata Rambur; Lumberton, April 7, six specimens (S & B),

*See Ent. News, vol. xiv, pp. 150–157, May, 1903.

* **Helocordulia selysi** Hagen; Southern Pines, March 28, one male (S); Lumberton, April 7, one male and two females (S & B). The spotting on the antenodals is much heavier in the two males than in the two females.

Perithemis domitia Drury; Fayetteville, July 10 (F).

Pachydiplax longipennis Burm.; Lumberton, July 3 (S); Washington, N. C. July 16 (S); Beaufort, N. C., June 11, 13 (S).

Mesothemis simplicicollis Say; Washington, N. C., July 16 (S).

Libellula cyanea Fabr.; Fayetteville, July 10 (F); Weldon, July 15 (F).

Libellula axillena Westw.; Beaufort, N. C., June 9, 11, 18 (S).

Libellula incesta Hagen; Washington, N. C., common (S); Raleigh, fairly common in May, June, July and August (B).

Libellula flavida Ramb. (**plumbea** Uhler); Raleigh, July 7, one male; August 25, two males (B).

* **Libellula auripennis** Burm.; Beaufort, N. C., June 9, 11, 18, five specimens (S); Washington, N. C., one male (S).

* **Libellula exusta** Say; there is a specimen in the entomological collections of Cornell University from North Carolina, but without date or locality (S).

* **Micrathyria berenice** Drury; Beaufort, N. C., June 4, 20, 24, thirteen specimens (S).

* **Pantala flavescens** Fabr.; Raleigh, July 22, one seen; August 10, one male taken in Green's rock quarry (B).

* **Tramea carolina** L.: Lumberton, April 7, two males (S & B).

* **Calopteryx amata** Hagen; two specimens in the entomological collections of Ohio State University, collected at Magnetic City, N. C., by Prof. W. C. Wetherby. (Prof. J. S. Hine in letter.) (B).

* **Calopteryx dimidiata** Burm.; Lumberton, April 7, three specimens (S).

* **Lestes inæqualis** Walsh; Raleigh, May 28, June 4, 10, 13, seven specimens (B).

* **Lestes disjunctus** Selys; Raleigh, July 15, one male (B).

* **Lestes forcipatus** Rambur; Lumberton, April 7 (S & B); Raleigh, March 31 to August 10; all taken later than April were in Green's rock quarry (S & B); Lumberton, July 3 (S).

Lestes rectangularis Say; Weldon, July 15 (F).

Argia putrida Hagen; Fayetteville, July 10 (F).

Argia tibialis Rambur; Fayetteville, July 10 (F). Several females from Raleigh and one from Fayetteville have the thorax with blue markings (B).

* **Argia fumipennis** Burm.; Lumberton, July 3, three specimens (S).

Argia bipunctulata Hagen; Raleigh, May 28, 30, July 8, 9, 15, 16; taken only along very small, somewhat marshy streams (S & B).

Erythromma conditum Hagen; Raleigh, common March, April, May; frequently seen resting with half-spread wings like a *Lestes* (B).

Anomalagrion hastatum Say; Raleigh, April to September, commoner late in the season (B).

Nehalennia posita Hagen; Raleigh, April to September, common throughout the season (B).

Ischnura ramburi Selys; Raleigh, May 27, June 8, in Green's rock quarry, July 18, one male on Walnut Creek (B); Washington, N. C., July 16 (S).

***Ischnura verticalis** Say; Raleigh, April 3, three females (B).

***Enallagma doubledayi** Selys; Raleigh, common from May to August in Green's rock quarry (B).

***Enallagma civile** Hagen; Raleigh, May 21, July 16, two males in Green's rock quarry (B).

***Enallagma aspersum** Hagen; Raleigh, common from May to August in Green's rock quarry (B).

***Enallagma traviatum** Selys: Raleigh, June 8, July 16, two males in Green's rock quarry (B).

***Enallagma divagans** Selys: Raleigh, May 16 to 28, around pools near Walnut Creek (B); Lumberton, April 7, one (S & B).

***Enallagma exsulans** Hagen; Raleigh, July 23, three males, on Neuse River, at Poole's (B).

***Enallagma signatum** Hagen; Raleigh, May 19, 21, August 5, five specimens in Green's rock quarry (B).

***Telagrion dæcki** Calvert; Raleigh, June 10, 13, 20, about 130 specimens in all taken; all were along the edges of the same large marsh; the females stayed mainly in the thickets a little distance from the marsh (B).

SPECIAL NOTICE.

A department for the advertisement of the wants of specialists, particularly those working on the classification of groups of insects.

Announcement: Under this heading and as part of "Notes and News," we wish to place announcements of the doings and wants of the systematist.

Persons wishing to obtain material for the sake of making more perfect classification, or for other work of a comprehensive character, are invited to send a notice of their intentions to this department. It is hoped that through the prominence given the news mentioned, all material in collections will be made available and the chances of duplicating work become remote. It is becoming more and more desirable that systematists should confine their efforts to the treatment of groups of species rather than to miscellaneous single descriptions, especially of species belonging to a group which has not yet been treated in some comprehensive work as a monograph or synopsis.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MARCH, 1904.

We not infrequently have inquiries in regard to the tariff laws in relation to insects. It would appear that there is a duty of ten per cent. ad valorem, as they would probably be classed under "raw" articles. Dr. L. O. Howard has very kindly sent us the following tariff regulations, with his comments:

Paragraph 20 of the Tariff of 1897 reads, "Drugs, such as barks, beans, berries, * * * dried insects, grains, gums, * * * etc., one-fourth of one cent per pound and in addition thereto ten per centum ad valorem." I imagine that this paragraph refers to Spanish flies and such things.

Paragraph 666 reads, "Specimens of natural history, botany and mineralogy, when imported for scientific public collections, and not for sale;" this is one of the paragraphs under the free list.

I find no other reference to collections of insects except that Paragraph 548 under the free list includes "drugs, such as barks, beans, berries, * * * dried insects, grains, gums, * * * any of the foregoing which are drugs and are not edible and are in a crude state and not advanced in value or condition by refining and grinding or by other process, and not specially provided for in this Act."

Of course collections not intended for public institutions come under the provisions of Section 6, which reads "That there shall be levied, collected and paid on the importation of all raw or unmanufactured articles, not enumerated or provided for in this act, a duty of ten per centum ad valorem, and on all articles manufactured, in whole or part, not provided for in this Act, a duty of twenty per centum ad valorem."

Entomological Literature.

DR. HOLLAND'S MOTH BOOK.—Criticism is disarmed at the outset, when the author saddles upon the would-be critic the responsibility for the determinations in his specialty. So the only point I have to call attention to in the Noctuidæ is a failure of my own to recognize an erroneous determination on Plate XXV. Figure 9 should be *ferrealis* instead of *petulca*. The original determination is not mine; the failure to recognize the error in proof is chargeable to me. Having thus acknowledged my sins, I am free to congratulate Dr. Holland on the excellent book that he has produced upon our favorite study and the impulse which it is sure to receive from it. There are some things that I don't like about it; but that is no proof that they are bad. I wish there had been no attempt to print half-tone figures on rough paper; it does not do justice to the block and does not much help the man who tries to identify the picture.

But the main feature to which I object is the complete surrender, in the Sphingidæ, to the doctrine that, where an author proposes a genus and lists a number of species under it without specifying a type, the first specific name on the list must be considered as such, irrespective of what others have done. This is contrary to the code of the American Ornithologists' Union, which has been generally followed by American entomologists, and it results in a complete reversal of the conceptions applied to some of our best-known generic names. I confess that I do not see my way clear to follow Dr. Holland in his acceptance of the Rothschild book; it is upsetting the practice of a century on a technicality that benefits no one, and kills the spirit that abstract justice may be done to the letter. Why should American entomologists discard the canons of a code prepared for the American ornithologists by some of the best systematists of our country? And why should we follow Rothschild rather than Kirby, Staudinger or Latreille? The interests of a stable nomenclature have not been advanced by the adoption of a new dispensation in a popular work.—J. B. SMITH.

THE MICRO-LEPIDOPTERA IN DR. HOLLAND'S MOTH BOOK.—The fifty-four pages of text, in which are forty-eight figures, usually illustrating life histories, and eighty-odd colored figures, will prove of much help to collectors in determining a few of their smaller captures; and is an earnest of what we may look for when Dr. Holland publishes his "Micro Moth Book"—the need of which is very apparent when we consider that more than one-third of all our Lepidoptera are embraced under this heading.

It is to be regretted that the text figures are so very poor, due to too rough paper or worn-out cuts of Riley's—or a combination of both; and that the colors of the figures of the plates are not as clear and natural as could be desired.

The percentage of errors of identification is gratifyingly small. I note the following:

Plate xlviii, Fig. 24, is *Olethreutes nimbatana* Clem., and not *Platynota flavedana* Clem. Fig. 40, same plate, is not *Epagoge tunicana* Wlsm. It is probably *Sparganothis senecionana* Wlsm.; but Dr. Holland is not responsible for this error, as there at least three different species in the Washington, Philadelphia and New York museums, all labelled *tunicana*. I hope to straighten this mix-up very soon.

Same plate, Fig. 22, *Tortrix albicomana* Clem. is very unlike the type which is in Academy of Natural Sciences, Philadelphia, and is a pale yellow insect. The form figured is rather unusual.

Pyrausta ochosalis, Fig. 57, plate xlvii, should be credited to Dyar and not Fitch MSS., as the former described this from Fitch's manuscript in a recent issue of the proceedings of the Washington Entomological Society.

Several of the generic names used by Dr. Holland differ from Prof. Fernald's latest published list of Pyralids, for what reason I do not know: *Zinckenia* Zell. for *Hymenia* Hbn.; *Glyphodes* Gn. for *Diaphania* Hbn.; *Phlyctænodes* Gn. for *Loxostege* Hbn; and he has repeated the error which occurs in both Dyar's Catalog and Smith's 1903 List: *Alceris* in place of *Acleris*.

Loxostege triumphalis Grt. possesses a melancholy interest, as it is the last or nearly the last North American species described by Grote. The type is in my collection.

One thing I feel very sorry about in a book that is bound to become so popular with the young collector, and that is the stone wall he has built around the method of expanding and handling these small specimens. Chapter two is principally given up to this subject, and among other impossible things calls for beveled glass slides—How many collectors, young or old, will go to this trouble and expense?—and also advocates the very questionable method of holding the wings down with one or more threads. I do not think one specimen out of fifty will dry flat and retain the larger proportion of its scales if set in the manner advised.—W. D. KEARFOOT.

THE general acclamation and praise with which Dr. Holland's long expected Moth book has been received are certainly well deserved, and it seems almost hypercritical in the face of the many excellent features which render the book almost indispensable even to the advanced student, to call attention to any defects. Unfortunately there are a few improperly identified figures which, while of no moment to the specialist, would certainly mislead beginners—the very class for whom the book is intended.

Dr. Dyar has already called attention, in the December issue of the Canadian Entomologist, to several misnamed figures, and I feel it is my duty to point out another, with profound apologies to Dr. Holland.

Figure 1, on Plate VI. is presented as *Cocytius antæus* Dr. ♀. It is

not that species at all, but is an excellent, tho' light colored, figure of *C. cluen'ius* Cr. ♂. I have a full series of *C. antæus* (*medor*) of both sexes as well as specimens of *rivularis, duponchelli, beelzebuth* and *cluentius.* For two years I received nearly all of Mr. Barrett's catch of *antæus* from Mexico, handling upwards of 100 specimens. *Antæus* is larger in both sexes and differently shaped in the wings than *cluentius;* is of a gray-green rather than chocolate brown, has a relatively and actually larger clear area in inferior wings; lacks the light brown dash near apex of fore wings, so characteristic of *cluentius;* and as far as my observation goes, *antæus* never has more than three pairs of distinct yellow spots on sides of abdomen, the basal pair being obsolete. *Cluentius* usually has six pairs of abdominal yellow spots, the basal pair being strongly marked. In *antæus* the yellow spots at base of inferior wings are confluent; in *cluentius* a dark dash separates them. The two species are abundantly distinct and contrast strongly when placed side by side, not intergrading like *C. antæus* and *C. antæus medor. Duponchelli, rivularis* and *beelzebuth* might, by an inexperienced eye, be confused with small specimens of *antæus,* but *cluentius* never. I trust Dr. Holland will pardon my calling attention to this, for I heartily admire the book.—ELLISON A. SMYTH, JR., Blacksburg, Va.

ODONATA OF MAINE.—Thanks to the kindness of Prof. Gilman C. Drew, successor of the late Prof. F. L. Harvey at the University of Maine, I have lately received a copy of *The University of Maine Studies No. 4. A Catalogue and Bibliography of the Odonata (Dragonflies) of Maine, with an Annotated List of the Collectors. By Francis Le Roy Harvey, Professor of Natural History. Orono, Maine, August, 1902.* 16 pp. This has been printed from one of those manuscripts which Prof. Harvey placed in my hands,* but which seemed to me to be more fittingly published by an institution of the State to which its subject-matter specially related. Since this paper may be overlooked by those interested in these insects, it seems worth while to call attention to its existence. The catalogue occupies nine pages, listing 34 genera and 94 species, of which latter 3 are Calopteryginæ, 27 Agrioninæ, 15 Gomphinæ, 4 Cordulegasterinæ, 8 Æschninæ, 18 Cordulinæ, 19 Libellulinæ, and is based on all the known records. The two pages of bibliography cite 22 papers by seven authors, while notes on thirteen "Collectors of Maine Odonates," with the names only of some others, are given on pages 14-16.—PHILIP P. CALVERT.

FIRST KATYDID—Why didn't you come before?
Second Katydid—Were you calling?
Was I calling? Don't you see how hoarse my legs are?—Exchange.

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*See the NEWS, vol. xi, p. 452; vol. xii, p. 178.

Doings of Societies.

The Tenth Regular Quarterly Meeting of the Pacific Coast Entomological Society was held at the residence of Leon Munier, 1148 Guerrero Street, San Francisco, on the evening of November 14th, President Fuchs in the chair. Seventeen members responded to roll-call. Five visitors were present, and two new members were elected.

Miss Julia Wright read a paper reporting the results of a collecting trip to Towles, Placer Co., exhibiting some sixty specimens of Coleoptera taken. Among the number were: *Omus rugipennis* Van Dyke MS., *Pterostichus inanis*, *Corymbites edwardsii*, *Trachykele lecontei*, *Buprestis gibbsii*, *Chrysobothris nixa*, *Ellochætes leoninus*, *Leptura grossa*, *Dyslobus segnis*.

Dr. E C. Van Dyke read an account of a short collecting trip to the Lake Tahoe region, giving an interesting account of the habits as far as known of the species of Coleoptera taken, exhibiting his catch, and also many species taken in North Carolina.

Mr. J. G. Grundel reported the life-history of *Chrysophanus gorgon*, exhibiting the pupa and food-plant (*Eriogonum*) of the same. He also stated that the larva of *Thecla augustus* very much resembles the larva of *C. gorgon* in shape, but that the color is pink. He found it feeding upon the flowers and buds of the Yerba Santa (*Eriodyction*) in the latter part of March and early part of April.

Mr. Edw. Ehrhorn reported a collecting trip to the Klamath Hot Springs in August, and also one to Pokagamu in September. Mr. Fuchs identified the following Coleoptera collected by him: *Cychrus obliquus* var. *convergens*, *Deretaphrus oregonensis*, *Cucujus puniceus*, and *Dyslobus segnis*. Mr. Ehrhorn stated that three new species of *Coccidæ* were taken.

Mr. F. W. Nunenmacher exhibited some rare *Coccinellidæ*, such as *Hyperaspis hornii* and *Scymnus myrmidon*.

Mr. Fordyce Grinnell showed a box of Lepidoptera from about Los Angeles, the following being especially noted: *Lasiocampa medusa*, *Anatolmis regulus*, *Nisoniades* sp., *Melitæa wrightii*, and *Colias cæsonia* var.

Mr. J. C. Huguenin drew attention to the following, in a

box that he exhibited: *Limenitis lorquinii* var., *Kodiosoma* sp., *Alypia lunata*, *Pieris sisymbri*, *Pyrameis caryæ* var. *mulleri*.

Sphinx chersis was presented by Mr. James Cottle.

Mr. Leon Munier showed a very nicely arranged box of miscellaneous Coleoptera. F. E. BLAISDELL, M.D., *Sec.*

At the meeting of the Feldman Collecting Social, held January 20th, at the residence of Mr. H. W. Wenzel, 1523 S. 13th St., Philadelphia, twelve persons were present.

This being the annual meeting, the President, Mr. C. R. Baerner, made his address, dealing with matters chiefly of interest to local entomologists.

Prof. Smith spoke on the dissemination of malaria by the mosquito, illustrating his talk with lantern-slides.

Mr. Haimbach exhibited *Chrysophanus hyphophlæus* and *Sabulodes transversata*.

The following officers were elected for 1904: *President*, C. R. Boerner: *Vice-President*, E. Daecke; *Secretary*, W. J. Fox; *Treasurer*, H. W. Wenzel.

D. M. CASTLE, *Secretary pro tem.*

The Entomological Section of the Chicago Academy of Sciences met in the John Crearar Library, at the usual hour, January 21, 1904.

Present—W. K. Higley, A. B. Wolcott, Wm. J. Gerhard, Emil Liljeblad, Alex Kwiat and W. E. Longley.

Mr. Wolcott read his paper on the characteristics and distribution of the Coleopterous genus *Charissa*, of which he had numerous specimens on exhibition.

It was an able paper, and unfortunate that so few were present to hear it.

Election of officers postponed until next meeting.

Secretary pro tempore.

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held January 28th, Mr. Philip Laurent, Director, presiding. Ten persons were present.

Mr. Rehn exhibited some New Jersey Orthoptera, among

them an apparently new species of *Melanoplus*. *Melanoplus impudicus* Scudder was taken. This species has been previously recorded from Georgia and Mississippi. *Paroxyia scudderi* Blatchley, previously recorded from Indiana only, was captured.

Dr. Calvert exhibited a ♂ and ♀ dragonfly taken at Salton, in the Colorado desert, southern California, by Prof. Wickham, 265 feet below the sea-level. The species was described by Currie as *Ischnura barberi*.

Mr. Laurent exhibited *Grapholitha caryana* reared from the husks of the hickory-nut. He also exhibited the cocoons of *Symphysa adelalis* Kft. on oak, taken at Anglesea. He found that a specimen of *Prionus laticollis* ♀ disclosed 440 eggs. Mr. W. R. Reinick was elected an Associate of the Section.

HENRY SKINNER, *Recorder*.

Minutes of meetings of Brooklyn Entomological Society, Brooklyn, N. Y.

January 9, 1902.—Eighteen persons present. Prof. John B. Smith, president, in the chair. The annual reports of the treasurer, librarian and secretary were presented. The officers of the preceding year were re-elected. Mr. Roberts reported the capture at Lakehurst of *Cælambus farctus*, *Agabus tæniolatus* and *Hydroporus cimicoides*, and stated that the occurrence of the latter north of South Carolina had not been previously noted.

Mr. Franck reported that *Melipotis nigrescens* had been taken near Jersey City, although supposed to be confined to the southern states. Prof. Smith added that these examples afforded proofs of an extension of the southern fauna into the Pine Barrens of New Jersey, and suggested that all specimens should be accurately labeled, that records of such migration might be preserved. Discussion as to the best gum to be employed. Tragacanth was unanimously approved, shellac was also useful, but fish-glue had been known to melt in cases and became stringy in hot weather.

Prof. Smith exhibited a number of lantern slides characteristic of European rustic and urban life and illustrating methods employed in preserving forests from the ravages of insects.

February 6, 1902.—Eighteen persons present. Mr. Edward L. Graef, vice-president, in the chair.

Mr. Weeks read an English translation of a clipping from a German newspaper entitled "$8,000 for a Butterfly" (*Ornithoptera paradisea*), with other instances of the extraordinary sums paid and hardships undergone to obtain various rare species, some of which were afterward taken in large numbers. Discussion by Messrs. Doll, Franck and Graef, giving instances of the capture of insects either rare or only locally so. *Catopsilia eubule* had been seen by thousands on the south shore of Long Island (Rockaway Beach), while *Colias cæsonia* had been taken in Prospect Park, Brooklyn. Mr. Doll stated that the first recorded capture of *Zeuzera pyrini* in this country was at Hoboken, in 1879, by Fred. Smith. The specimen was a female, found still living in a spider's web, and was for many years in the Neumoegen collection.

Discussion as to the best methods of destroying mosquitoes and to what extent they acted as purveyors of disease. Mr. Weeks preferred draining or filling, wherever practicable, as affording permanent relief, to kerosene applications, which were only temporary.

March 6, 1902.—Twenty persons present. Prof. John B. Smith, president, in the chair.

Discussion as to the effect of heat and cold upon maculation of wings of Lepidoptera. Mr. Englehardt exhibited variations of *Vanessa antiopa* in which the blue submarginal spots were more or less obsolete, and which had resulted from the exposure of the pupæ, directly after the transformations from larvæ, to extremes of heat and cold. Mr. Wasmuth mentioned his capture of specimens of *Arctia arge* the secondaries of which were highly suffused while the moths caught elsewhere in the vicinity were of the ordinary type. Mr. Weeks offered as an explanation that this arctian pupated in the spring, when the weather was variable, and inasmuch as the fresh pupæ were insufficiently protected, it was more likely to be exposed to and affected by extreme climatic changes, and that the location of the place of pupation as to whether the exposure were northern or southern might be a factor in causing variation.

Mr. Doll exhibited a fine series of *Junonia cœnia* showing extremes of light and dark forms either bred or captured by himself during a number of years.

Mr. Wasmuth exhibited a unique aberration of *Samia cynthia*, the submarginal band being nearly three-fourths of an inch in width, with increased lightness of color.

Mr. Weeks read a memorial upon the life of Mr. John Akhurst, a recently deceased member of the Society, with a description of his entomological collection, and presented resolutions of regret and condolence, which were unanimously adopted.

April 3, 1902.—Twenty-four persons present. Mr. Ludwig B. Goldhorn was elected a member.

Mr. Gustav Beyer related his experiences upon a collecting trip to San Lucia, Lower California. He remained there from February to October, and brought back many fine specimens of Coleoptera, embracing some new species. During the first six months no rain fell, and the excessive aridity rendered sifting and sweeping unavailable. He therefore had recourse to breeding, and transported thither five packing-boxes, the tops of which were covered with muslin. These were filled with larvæ-infested cactus logs. The larval borings could not be detected from the exterior, but by stripping off the outer bark the presence of the larvæ was easily ascertained. A few beetles, including some Cerambycidæ and Buprestidæ, were taken on leaves and flowers during the dry season. One large species of Scarabæid, *Megasoma thersites*, frequented the tree-tops, and could only be dislodged by climbing as high as possible and then violently jarring the branches. Mr. Beyer made a number of collecting trips to the mountains, with varying success. He exhibited many of the specimens taken.

Mr. Franck exhibited some interesting variations of *P. troilus* ♂, *P. turnus* ♀, *M. phaeton* and *C. philodice*, the primaries of the *troilus* being deeply indented with white, caused by the coalescing of the marginal lunules with the submarginal rows of white dots. The greenish tinge in the interior of the secondaries was also much lighter, and many of the submarginal spots were obsolete. Captured in New Jersey.

Benjamin Franklin Koons.

Benjamin Franklin Koons died at his home in Storrs, Connecticut, December 17, 1903. He was born September 8, 1844, at Sulphur Springs, Ohio. At the age of seventeen he enlisted in the 123d Ohio regiment, and served till the close of the Civil War; after which he worked his way through Oberlin, graduating with the degree of Bachelor of Arts in 1874. Mr. Koons received the degree of Ph. D. from Yale University in 1881. He spent several summers working with the United States Fish Commission. In the fall of 1881 he was appointed Professor of Natural History in the Connecticut Agricultural College (then Storrs Agricultural School), and from 1883 until 1898 was at the head of the institution. From then until his death he was Professor of Natural History and Curator of the Museum, which contains valuable material largely collected by Professor Koons from many parts of the United States, including the National Park and Alaska. Although Professor Koons has published little of entomological interest, he was a careful student of the subject, keeping well informed. His popular lectures were interesting and instructive, and the students received much of practical value from his course in Economic Entomology. For many years he was Entomologist of the Connecticut State Board of Agriculture.

Professor Koons was a man of a quiet nature, but firm in his convictions. He was respected by all the students, and his death is mourned by many friends.

CORRECTIONS IN THE LIST OF NORTH CAROLINA CICINDELIDÆ.—There are two matters which need attention in my "List of the Cicindelidæ of North Carolina" (ENT. NEWS, vol. xv, p 26–32).

Cicindela 6-guttata has been taken at Raleigh, thus adding a new locality. This would scarcely be worthy of record were it not for the fact that it does not seem to be at all common here, the one specimen taken on April 29, 1903, by myself, being the only record.

The other matter is one of credit. Under *Cicindela purpurea* it should have been stated that the species was taken at Blowing Rock by Mr. C. O. Houghton and myself. We were together upon that occasion. Under *Cicindela abdominalis* Mr. Houghton should also have been given credit for taking the species with me at Southern Pines. Indeed, of the five specimens taken, Mr. Houghton captured three.—FRANKLIN SHERMAN, JR, Entomologist N. C. Dept Agr., Raleigh, N. C.

EXCHANGES.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Coleoptera of France exchanged for American species.—J. Perret, Place St. Maurice, 3 Vienne, Isere, France.

Will exchange California specimens, *Attacus ceanothi* cocoons, etc., for flies caught in other places that also inhabit California.—J. E. Cottle, 1020 Pacific Ave., San Francisco, Cal.

Wanted eggs of *Argynnis diana*.—I. RUSTON, 10 Carlton Road, Workshop, Nottinghamshire, England.

Wanted.—Lepidopterists desiring *Bembecia marginata* and var. *albicoma*, to send exchange lists of North American moths.—HENRY ENGEL, Genl. Delivery, Pittsburg, Pa.

I have a few specimens of *C. calleta* and *cinctus* to exchange for rare *sphinx* or pupæ of same.—W. T. BUXTON, 153 Walnut St., Somerville, Mass.

Wanted for cash fertile eggs of *A. luna*, *S angulifera*, *H. io*, *E. imperialis*, *C. regalis*, also of all kinds Sphingids.—ERNST JEHEBER, 118 N. Reservoir Street, Lancaster, Pa.

Wanted.—Complete files, with indexes, of American Entomologist and its successor, the American Entomologist and Botanist; also of Insect Life.—CHAS. S. DAVIS, No. 1910 Fifth St. N. W., Washington, D. C.

Wanted.—Cocoons of *A. luna*, *S. cynthia*, *Att promethea*, *Att. Gloveri*, *Att. cecropia*, *Hyper Io*, and *Eacles imperialis*. Will pay cash for a few of each.—DR TILLOTSON, 744 Clinton ave., Rochester, N. Y.

Cortynas wanted.—Good prices or exchange will be given for fine specimens of *albilunata*, *erepta*, *u-album*, *juvenilis*, *medialis*, *senilislatia*, *cerina*, *speciosissima*, *verona*, *frigida*, *unimoda*, *angelica*, *insulidens*, *furcata*, *sauzælitæ*, *buffaloensis*.—H. H. LYMAN, 384 St. Paul St., Montreal.

Wanted.—Perfect colored sketches of American caterpillars (larger Sphinges and night-flies), also broken specimens of exotic macros. Correspondence solicited.—C. V. Blackburn, 101 Pine St., Woburn, Mass.

North American Lepidoptera for exchange.—Also live cocoons and pupæ, Catocalas preferred.—Herman J. Erb, 536 Blum Place, Union Hill, N. J.

Lepidoptera of all kinds wanted for exchange of other specimens. Send list to Chas. Krueger, 1161 N. Lincoln St., Chicago, Ill.

Cicindelidæ wanted.—Cash or exchange for other insects.—Charles Stevenson, 906 St. Urbain St, Montreal, Canada.

Lepidoptera wanted.—*Chrysophanus hypophleas* and vars., from all parts of North America. Also *Arg. atlantis* and *electa*, and many common Noctuidæ, including *Cosmia paleacea*.—E. H. Woolley Dod, Millarsville, Alberta, N. W. T., Canada.

Lepidoptera.—I have 200 *cecropia*, 100 *polyphemus* and 400 *cynthia* cocoons to exchange for other North American Lepidotpera.—Ferdinand Goeben, 464 Atlantic Ave., Brooklyn, N. Y.

Wanted.—Tortricids and Micro-Lepidoptera, especially from the West. Will pay cash and furnish pins, mailing boxes and full instructions.—W. D. Kearfott, 114 Liberty St., New York, N. Y.

Lepidoptera.—For exchange, fertile eggs of *Hemileuca maia*—Alfred C. Sampson, Sharon, Mass.

Exchange.—Would like to exchange Coleoptera from Austria for N. American. Correspondence German and French.—Otto Spicack, K. K. Postbeamtor, Sternberg, Mähren, Austria

Illinois, Lake Superior, Texas and Californian Dytiscidæ wanted in exchange for Dytiscidæ and other Coleoptera.—John D. Sherman, Jr., 390 Halsey St., Brooklyn, N. Y. City.

Wanted.—In exchange or for cash various species and varieties of the genus *Eubaphe* (*Crocota*). Other Lepidoptera also desired, especially mounted specimens. Send lists to A. Kwiat, 701 Larrabee St., Chicago, Ill.

Polistes.—I wish to correspond with entomologists all over the country who are willing to aid me in the study of this genus.—S. Arthur Johnson, Fort Collins, Colo.

Wanted.—Bulletin Brooklyn Entomological Society, vol. i, No. 10, or the complete volume —Wm. J. Fox, care of NEWS.

Will exchange North American Lepidoptera for native, Exotic or European species. Send lists to Jos. H. Reading, 775 North Rockwell Street, Chicago, Illinois

A full line of Arizona Coleoptera. Apply to agent, Mr. Chas. Palm, 172 East 64th Street, New York; Dr. R. E. Kunzé, Phœnix, Arizona, U. S A.

Moths of Pennsylvania and New Jersey. The undersigned will give good exchange in cash or specimens for moths of Pennsylvania and New Jersey that are new to his collection. Send list of rare species only. Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Pa.

Native pupae for exchange, including *regalis*, *ceanothi*, *luna*, *calleta*. Native pupæ desired. W. T. Buxton, 17 Walter Street, Somerville, Massachusetts.

Lepidoptera. I have a few *luna* cocoons to exchange for *ceanothi* or pupæ of *Papilios* not found in this locality.—Miss Kate W. Strong, Setauket, Long Island, New York.

I have a few live pupæ of *Deidamia inscriptum* to exchange. I wish live pupæ of *Darapsa versicolor* and *Calasymbolus astylus*.—R. R. Rowley, Louisiana, Mo.

Megachilidae of the Americas wanted for study. Will exchange or purchase.—E S. G. Titus, Div Entom. Dept. Agric., Washington, D. C.

Wanted.—Copies of ENT NEWS for January, 1903, Vol. xiv, No. 1.—Henry Skinner, 1900 Race St, Philadelphia, Penna

Lepidoptera.—*Papilio gundlachianus* for exchange.—Captain Wirt Robinson, Fort Caswell, North Carolina.

Wanted for Cash—Living cocoons or pupæ of Lepidoptera of U. S. A. W. T. Page, 6 Rylett Crescent, Shepherd's Bush, London, W., England.

Lepidoptera to exchange for specimens not yet in my collection. Send lists to Adolph Fischer, 502 School Street, Chicago, Ill.

Exchange.—Coleoptera in papers, with data. Will collect in this locality this season. Send lists.—Rev. J. C. Warren, Elma, Iowa.

Have for exchange.—Named species of Coleoptera, named and unnamed species Lepidoptera, Hymenoptera. Diptera, Neuroptera and Odonata of this locality, for named species of U. S. and Canada.—A.W. Andrews, 180 Helen Ave., Detroit, Mich.

Wanted.—Material for the study of the hybrid or polymorphic butterflies of the genus *Basilarchia*, including larvæ or pupæ of *arthemis* or *astyanax*, imagos of *proserpina* or *arthechippus*, or any specimens showing unusual characters. Liberal exchange. Specimens retained will be deposited in Museum of Comparative Zoology.—W. L. W. Field, Milton, Mass.

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